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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/608,826

06/26/2003

William W. Buchanan JR.

RPS9-2003-0095

8068

45219 7590 06/28/2006

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EXAMINER

VO, THANH DUC

ART UNIT

PAPER NUMBER

2189

DATE MAILED: 06/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/608,826

Applicant(s)

BUCHANAN ET AL.

Examiner

Thanh D. Vo

Art Unit

2189

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 06 December 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-35 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

1. This Office Action is responsive to the Application filed on June 26, 2003. Claims 1-35 are presented for examination. Claims 3-9 are pending.

#### ***Claim Objections***

2. Claims 5 and 6 are objected to because of the following informalities:

As per claims 5 and 6, the term "the host" should be written as - "the host computer".

As per claim 6, the term "to" before "the RAID controller" should be written as- and. The term "connect" should be written as – "connected".

Appropriate correction is required.

#### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 25-28 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

As per claims 25-28, Applicants failed to disclose "a computer readable image comprising computer readable program code" in the Specification.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1, 3, 5-8, 12-16, 23-25, 26, 29, and 31-35 rejected under 35 U.S.C. 102(e) as being anticipated by Smith

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention “by another,” or by an appropriate showing under 37 CFR 1.131.

In respect to independent claims 1, 13, 24, 25, and 29:

As per claims 1, 24, and 29 Smith discloses an apparatus for alternate control of a storage array, the apparatus comprising:

a host computer (See Fig. 1, item 12);

a storage array comprising a plurality of storage devices (See Fig. 1, item 11 and page 3, paragraph 0027, lines 1-4);

a RAID controller operably connected to a storage array (See Fig. 1, item 14 and item 11), the RAID controller configured to receive storage commands from a host computer and execute corresponding operations on the storage array (See page 3, paragraph 0032, lines 5-9);

a storage adapter (interface at the server of interface path 22 in Fig. 1) residing on the host computer (See Fig. 1, item 12 and 22), the storage adapter operably connected to the storage array independent of the RAID controller (See page 3, paragraph 0027, last sentence), the storage adapter configured to transmit storage commands to a selected storage device within the storage array (page 3, paragraph 0028, last sentence); and

a control module (See Fig. 1, item 36) residing on the host computer 12, the control module configured to selectively direct storage commands to the RAID controller and the storage adapter (page 3, paragraph 0028, lines 8-18).

As per claims 13 and 25, Smith discloses a method for alternate control of a storage array, the method comprising:

transmitting storage commands to a RAID controller configured to conduct storage operations on a storage array (See page 3, paragraph 0032, lines 5-9);

transmitting storage commands via a storage adapter (interface at the server of interface path in Fig. 1) to a selected storage device within the storage array (page 3, paragraph 0028, last sentence); and

selectively directing storage commands to the RAID controller and the storage adapter. See page 3, paragraph 0028, lines 8-18, wherein the command is either sent to RAID controller or interface path.

In respect to dependent claims 3, 5-8, 12, 14-16, 23, 25, 26, and 31-35:

As per claim 3, Smith discloses an apparatus, wherein the control module comprises a multipath software layer. See Fig. 1, item 36 and page 3, paragraph 0028, lines 8-18, wherein the program instructions comprise of program code and instructing various operations or events.

As per claim 5, Smith discloses an apparatus wherein the RAID controller 14 resides on the host (storage system 11). See Fig. 1.

As per claim 6, Smith discloses an apparatus, further comprising a controller adapter (See Fig. 1, item 28) residing on the host, the controller adapter configured to operably connected the host and the RAID controller. See Fig. 1, items, 28, 18, and 14, wherein they're operably connected together.

As per claims 7, 16 and 31, Smith discloses an apparatus, wherein the control module 36 is further configured to conduct RAID operations via the storage adapter 22. See page 3, paragraph 0028, lines 8-10, and 15-18, wherein the control module 36 uses to trigger PFA of raid storage system and the interface path 22 also triggers to the

PFA, therefore the control module is conducting RAID operation once it is determined that the server should bypassing the RAID controller to use the interface path.

As per claims 8 and 26, it is inherent in the system of Smith for the control module is configured to selectively emulate a RAID controller since it is noted from claim 7 that the control module is conducting RAID operation once it is determined that the server should bypass the RAID controller. Therefore, the control module is operating the necessary RAID operations in order to access the RAID storage.

As per claims 12 and 23, the controlling module comprises a driver configured to translate operating system calls to storage commands. See Fig. 3 and page 3, paragraph 0028, lines 7-10, wherein the driver to translate operating system calls is an inherent feature in the control module 36 since the storage commands are sent to the PFA from the control module 36 has to be translated since the commands are passing through an intermediate transmission path.

As per claim 14, Smith teaches a method further comprising the storage adapter (interface 22) emulating a RAID controller. See page 3, paragraph 0027, last sentence and paragraph 0028, lines 15-18, wherein the interface path 22 can emulate the RAID controller when the server decides to use the interface path instead of the RAID controller to transmit the command to the storage system.

As per claim 15, the method wherein emulating a RAID controller further comprises retrieving RAID configuration information is inherent in the system of Smith since the configuration information of the RAID storage system has to be sent to the server and determined by the program instruction 36 before the program instructions issuing the commands related to event of operations such as rebuild operations.

As per claim 32, Smith discloses a mass storage interface 28 that is used to connect the server 12 to RAID controller 14. See page 3, paragraph 0028, lines 1-5. Therefore, the method of servicing the RAID controller is inherent in the system of Smith since the mass storage interface 28 is used to further enhance the operation between the server and the array storage via the RAID controller.

As per claim 33, the method of updating a firmware within a storage device is an inherent feature since new DDMs 16 can be added and therefore a firmware needed to be updated once a new device is attached to the system. See page 3, paragraph 0028, lines 11-14.

As per claim 34, Smith discloses a method of diagnostic operations (page 2, paragraph 0015, line 4).

As per claim 35, Smith discloses a method of page 3, paragraph 0028, line 11.



***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 9-11, 18-22, 27, 28, and 30 are rejected under 35 U.S.C. 103(a) as being obvious over Smith.

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(I)(1) and § 706.02(I)(2).

As per claim 9, 10, 18, 19, 27, 28, and 30, although Smith did not teach a method of disabling or quiescing the RAID controller but it would have been obvious to one having an ordinary skill in the art at the time of the Applicant's invention to readily recognize that the once the server decides to bypass the RAID controller and to take the interface path as an alternative path (page 3, paragraph 0027, last sentence) to communicate with the storage array then the RAID controller is not being used, therefore the RAID controller should either be disabled or quiesced to save power usage and/or reduce the complexity of the communication path.

As per claims 11 and 20, Smith discloses an apparatus wherein the control module is further configured to conduct operations selected from the group consisting of read/write operations (page 3 paragraph 0032, lines 1-2), recovery operations (page 3, paragraph 0028, line 11), diagnostic operations (page 2, paragraph 0015, line 4), and firmware update operations (wherein firmware update is an inherent feature of Smith since new DDMs 16 can be added and therefore a firmware needed to be updated). See page 2, paragraph 0015, lines 3-7, page 3, paragraph 0028, lines 8-18.

Although Smith did not specifically disclosed the formatting operations but formatting operation is a well-known operation in the storage system that it would have been obvious to one having an ordinary skill in the art at the time of the Applicant's invention to include the formatting operation in the system of Smith since Smith

discloses in page 3 paragraph 0028, lines 8-12 that the operation is not limited to those operations that are in Smith's disclosure.

As per claims 21 and 22, although Smith did not explicitly teach a method of disabling or quiescing the storage adapter but it would have been obvious to one having an ordinary skill in the art at the time of the Applicant's invention to realize that once the server is using the RAID controller to communicate with the array storage then the storage adapter (interface path) should either be disabled or quiesced in order to save power usage and/or reduce the complexity of the communication path.

7. Claims 2 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith in view of DeKoning et al.

As per claims 2 and 4, Smith failed to particularly teach wherein the storage adapter or RAID controller is selected from the group consisting of a SCSI adapter, an SSA adapter, a fiberchannel adapter, and an IDE adapter.

DeKoning et al. teaches the storage control modules using the standard interface such as SCSI, SSA, FC, and IDE interfaces. See col. 7, lines 48-61.

It would have been obvious to one having an ordinary skill in the art at the time of the Applicant's invention to select one out of the standard interfaces thereof in order to provide the communication method required by the RAID storage system as disclosed by DeKoning et al. at lines 48-50.

8. Claim 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith in view of Wang et al.

As per claim 17, Smith teaches a method of selectively directing storage commands to different path by bypassing the RAID controller (page 3, paragraph 0027, last sentence). Smith did not explicitly disclose a method of directing storage commands in response to detecting a faulty RAID controller. However Wang et al. discloses a method of detecting a faulty RAID controller and replacing it by another controller. See col. 21, lines 51-52.

Therefore, it would have been obvious to one having an ordinary skill in the art at the time of the Applicant's invention to combine the method of Smith with the method of Wang et al. in order to arrive at the current invention. The motivation of doing so is redirecting the storage commands to the interface path in the system of Smith once it is determined that the RAID controller has failed in order to provide a stable and continuous running system instead of halting the system due the RAID controller failure.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanh D. Vo whose telephone number is (571) 272-0708. The examiner can normally be reached on M-F 9AM-5:30PM.

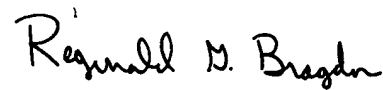
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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Reginald G. Bragdon can be reached on (571) 272-4204. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Thanh Vo  
Patent Examiner  
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6/24/2006



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